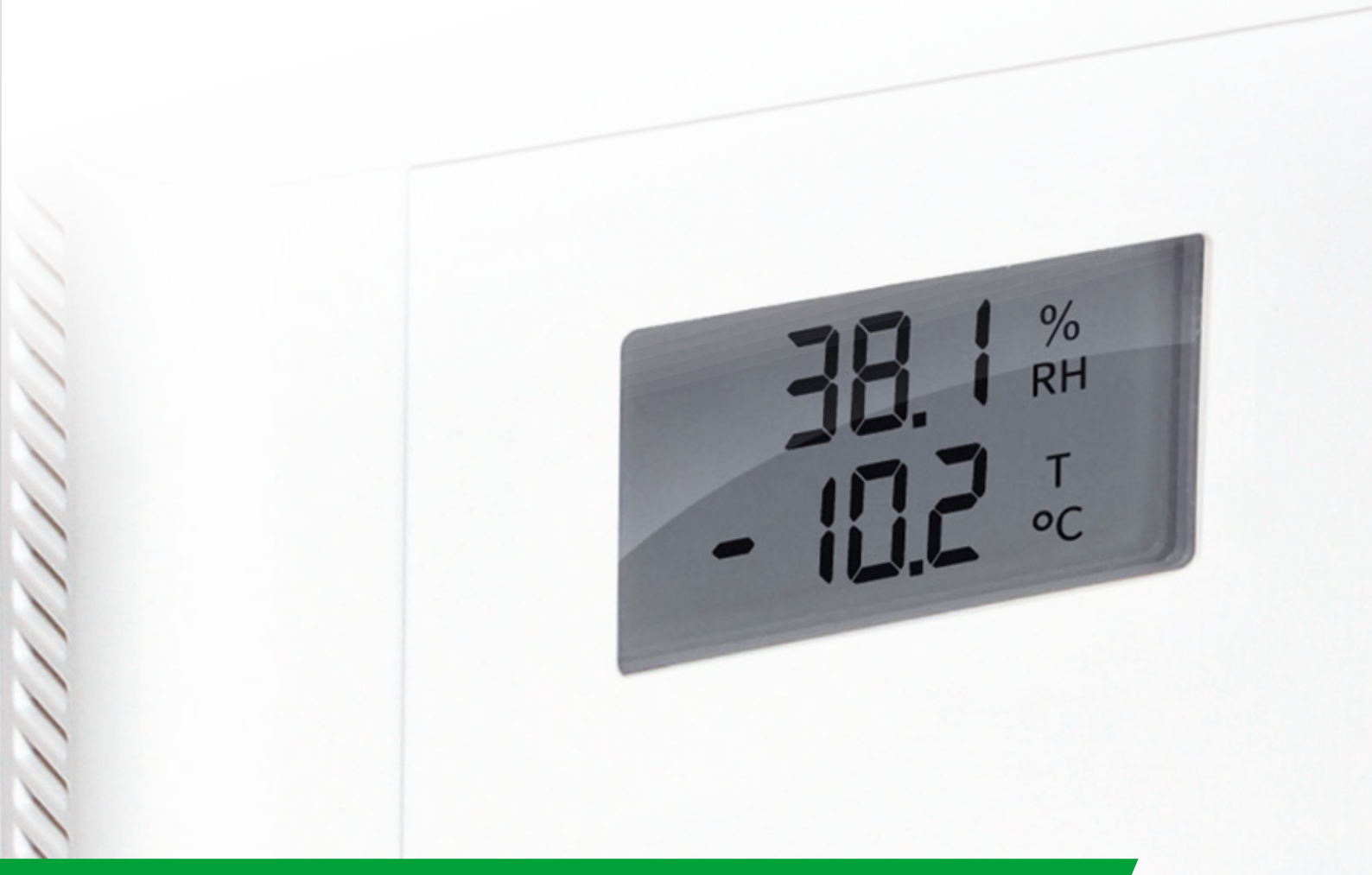
HygroMatik®

member of CAREL group CAREL

Sensors and hygrostats

for humidification systems



Climate and process humidification

for industry, manufacturing processes, public buildings and offices

Sensors and hygrostats for humidification systems

The basis of a reliable and precise control of air humidity

Application-oriented control – no coincidence from the very beginning.

The air humidity in a room has a decisive influence on the room climate and thus has a major impact on the well-being of people. Even sensitive production processes or the storage of hygroscopic materials, such as paper, wood or fabric, can be optimised by controlling the air humidity.

How stable and precise this control can be during operation depends mainly on the recording of the humidity values. The selection and placement of suitable sensors and hygrostats therefore plays a special role in the configuration of the overall system.

Our portfolio includes a diverse selection of sensors and hygrostats for different application needs for installation in rooms or ducts. All sensors are compatible with the controls of the HygroMatik steam humidifiers and support the current international technical market standards.

Five basic considerations serve as a simplified decision-making aid.

1. Continuous or single-stage control?

Continuous control

Analogue data acquisition and continuous control signal transmission

Single-stage control

Setpoint with fixed hysteresis as digital switching threshold

2. Which method is used for measurement?

Depending on how stable and precise the humidity should be kept at a certain value, different methods of value acquisition and signal transmission are used.

Capacitive measurement

Changes in humidity values are directly recorded and immediately converted into a control signal change.
A PI controller integrated in the humidifier control prevents overriding and thus enables extremely precise real-time humidity control.

Absorptive measurement

This method corresponds to the natural behaviour of moisture absorption and leads to a damped, sliding control behaviour.

3. Sensor position: in room or duct?

Depending on the application and the required humidification method, the sensors and hygrostats are mounted in the room or in a ventilation duct (supply air or exhaust air). The following types can be distinguished accordingly:

Room sensors

- Exact recording of the relative humidity in the room for proportional control
- E.g. in combination with direct room humidification

Room hygrostats

- Simple solution if a humidity range only needs to be roughly maintained, e.g. in storage rooms
- As additional safety device in connection with room sensors for monitoring a maximum value

Duct sensors

- Building and process humidification, e.g. for sensitive production areas such as lacquering
- Can either be integrated into the building control system or connected directly to the humidifier as a stand-alone solution

Special duct sensors

- With a second control signal, which indicates the relative humidity as well as the absolute humidity, the moisture content can be measured independent of temperature
- Version including isolation amplifier: for ex-areas, i.e. areas with a high risk of explosion, e.g. due to dust

Duct hygrostats

- Simple solution if a humidity range only needs to be roughly maintained
- As additional safety device in connection with room sensors for monitoring a maximum value

Flow monitors

- Enable continuous control of the air differential pressure for air conditioning and ventilation systems
- For safety-related monitoring in air conditioning systems, e.g. reporting fan interruptions and filter clogging

Differential pressure switches

- Flow monitoring in the duct
- Can either be integrated into the building control system or connected directly to the humidifier as a stand-alone solution

Leakage monitors

Protection against water leaks in data centres, offices, laboratories and specific rooms

4. Integrated measured value display

In some application areas it is useful that the measured values can be displayed and read directly at the sensor, e.g. if a humidifier is difficult to access or as an additional comfort feature.

5. How precise should the measurement be?

* Precision		Working area	Temperature
✔	+/- 5%	10-90 % RH	-10°-60 °C
✔✔	+/- 5%	0-100 % RH	-20°-70 °C
✔✔✔	+/- 2%	0-100 % RH	-30°-80 °C

Decision aid

	1-stage or continuous	Method	Display	Precision*	Sensor, Hygrostat	Product range
Room system	continuous	capacitive	✘ / ✔	✔✔✔	Sensor	HygroMatik DIF (0-10V)
	continuous	capacitive	✘ / ✔	✔✔✔	Sensor	HygroMatik DW
	continuous	capacitive	✘	✔✔✔	Sensor	CAREL DPP Sensor
	1-stage	absorptive	✘	✔	Hygrostat	HygroMatik HygroSwitch
	1-stage	absorptive	✘	✔	Hygrostat	CAREL Hygrostat
Duct system	continuous	capacitive	✘ / ✔	✔✔✔	Sensor	HygroMatik DKF (0-10V)
	continuous	capacitive	✔	✔✔✔	Special sensor	HygroMatik DKK (0-10V)
	continuous	capacitive	✘	✔✔✔	Sensor	CAREL DPD Sensor
	continuous	absorptive	✘	✔✔✔	Sensor	HygroMatik FG80
	continuous	capacitive	✘	✔✔✔	Special sensor	HygroMatik FK C3 EX/8 for ex-areas (4-20mA)
	1-stage	absorptive	✘	✔✔	Hygrostat	HygroMatik HG80 (KF1)
	-	-	✘	-	Sensor	CAREL Air flow monitor
	-	-	✘	-	Sensor	CAREL Differential pressure switch
	-	-	✘	-	Sensor	CAREL Leakage monitor

HygroMatik DIF (0-10V)

Room humidity sensor, capacitive

Specially designed for comfort air conditioning in e.g. offices.

Extremely precise with integrated measuring chamber. Easy mounting with clip-in cover.

Technical specifications

Power supply:
15-30 VDC
13-26 VAC, 7mA

Operating conditions:
-30°-60 °C, 0-100% RH

Protection class:
IP30D (housing)

Installation: in the room

Output signal: 1 x 0...10 V

Dimensions: 81 x 81 x 26 mm

Article number: E-0610190
without display

Article number: E-0610200
with display

HygroMatik DW

Room humidity sensor, capacitive

Especially suitable for precise measurements with increased environmental requirements such as production facilities. Easy to install due to installation-friendly housing.

With hx processor, USB interface and integrated calibrated dModule. On-site calibration via keys and readout via LED display possible.

Technical specifications

Power supply:
15-30 VDC
13-26 VAC, 7mA

Operating conditions:
-30°-70 °C, 0-100% RH

Protection class: IP65 (housing), IP30 (sensor element)

Installation: in the room

Output signal: 1 x 0...10 V

Dimensions: 83 x 133 x 40 mm

Article number: E-0610192
without display

Article number: E-0610194
with display

CAREL DPP Sensor

Active temperature / humidity sensor, capacitive

Specially developed for the precise measurement of high humidity levels. Also available are models with RS485 connection with CAREL Modbus protocol.

Technical specifications

Power supply:
12/24 VAC -10/15%,
9-30 VDC ±10%

Operating conditions:
-10-60 °C, -20-70 °C,
0-100% RH, no dew

Protection class: IP55 (housing), IP54 (sensor element)

Installation: in the room

Output signal:
2 x analogue output with same signal type -0,5…1 V, 0…1 V, 0…10 V, 4…20 mA

Serial interfaces:
RS485 (specific model)

Dimensions: 98 x 170 x 44 mm

Article number: DPPC 21 0000
(analogue output: selection 0...1 V/-0,5...1 VDC/4...20 mA)

Article number: DPPC 21 2000
(analogue output: 0...10 VDC)

HygroMatik HygroSwitch

Room hygrostat, absorptive

For controlling air humidification and dehumidification in office and server rooms by means of an integrated two-point controller for controlling relative humidity.

Technical specifications

Switch contact:
200-250 VAC, max. 2A

Operating conditions:
0-60 °C, 40-90% RH

Protection class:
IP30D (housing)

Installation: in the room

Dimensions: 81 x 81 x 28 mm

Article number: E-0610186
without setting wheel

Article number: E-0610188
with setting wheel inside

CAREL Hygrostat

Room hygrostat, absorptive

For humidification in office and server rooms using 1-stage humidity control.

Technical specifications

Switch contact:
200-250 VAC, max. 3A

Operating conditions:
0-40 °C, 20-90% RH

Protection class:
IP20 (housing)

Installation: in the room

Dimensions: 76 x 76 x 34 mm

Article number: UCHU MM 0000

HygroMatik DKF (0-10V)

Duct humidity sensor, capacitive

Especially suitable for precise humidity control in HVAC systems. Equipped with an hx-processor for the values of RH and temperature to calculate the dew point, enthalpy, mixing ratio, absolute humidity or wet bulb temperature. Integrated calibrated dModule and on-site calibration via keys and readout via LED display possible. Easy to install due to assembly-friendly housing.

Technical specifications

Power supply:
15-30 VDC
13-26 VAC, 7mA

Operating conditions:
-30°-80 °C, 0-100% RH

Protection class: IP65 (housing), IP30 (sensor element)

Installation: in the air duct

Output signal: 1 x 0...10 V

Dimensions: 83 x 83 x 260 mm

Article number: E-0610184
without display

Article number: E-0610202
with display

HygroMatik DKK (0-10V)

Special sensor, capacitive

Especially suitable for precise humidity control in HVAC systems. Equipped with an hx-processor for the values of RH and temperature to calculate and control signal output of the dew point, enthalpy, mixing ratio, absolute humidity or wet bulb temperature. Integrated calibrated dModule and on-site calibration via keys and readout via LED display. Easy to install due to assembly-friendly housing.

Technical specifications

Power supply:
15-30 VDC
13-26 VAC, 7mA

Operating conditions:
-30°-80 °C, 0-100% RH

Protection class: IP65 (housing), IP30 (sensor element)

Installation: in the air duct

Output signal: 2 x 0...10 V

Dimensions: 83 x 83 x 260 mm

Article number: E-0610182
with display

CAREL DPD Sensor

Active temperature / humidity sensor, capacitive

Suitable for air conditioning systems. Also available are models with RS485 connection with CAREL and Modbus protocol.

Technical specifications

Power supply:
12/24 VAC -10/15%,
9-30 VDC ±10%

Operating conditions:
-10-60 °C, -20-70 °C,
<100 % RH, no dew

Protection class: IP55 (housing), IP54 (sensor element)

Installation: in the air duct

Output signal:
2 x analogue output with same signal type -0,5…1 V, 0…1 V, 0…10 V, 4…20 mA

Serial interfaces:
RS485 (specific model)

Dimensions: 98 x 105 x 336 mm

Article number: DPDC 21 0000
(analogue output: selection 0...1 V/-0,5...1 VDC/4...20 mA)

Article number: DPDC 21 2000
(analogue output: 0...10 VDC)

HygroMatik FG80

Duct humidity sensor, absorptive

Designed for natural relative humidity and temperature measurement in air ducts.

With robust Polyga® humidity measuring element. Excellent for use in high humidity applications and when long-term stability and a long operating time are required. Resistance output up to 10kOhm.

Technical specifications

Power supply:
15-30 VDC
21,6-26,4 VAC, 20mA

Operating conditions:
-30°-80 °C, 0-100% RH

Protection class: IP65 (housing), IP64 (sensor element)

Installation: in the air duct

Output signal: 1 x 0...10 V

Dimensions: 80 x 120 x 300 mm

Article number: E-0610151
FG80AC (0...10V)

Article number: E-0610196
FG80J (4...20mA)

HygroMatik FK C3 EX/8

Special sensor for ex-areas, capacitive

Developed for explosion-hazardous areas and high operating temperatures.

Equipped with a robust die-cast aluminium housing with a stainless steel or aluminium sensor element for measuring relative humidity and temperature in air and other non-aggressive gases for an operating temperature range up to 200 °C.

Technical specifications

Power supply:
13-24 VDC, 100mA

Operating conditions:
-40°-80 °C, 0-100% RH

Protection class: IP65 (housing), IP30 (sensor element)

Installation: in the air duct

Output signal: 1 x 4...20 mA

Dimensions: 80 x 75 x 288 mm

Article number: B-0610171

HygroMatik HG80 (KF1)

Hygrostat, absorptive

Designed for natural relative humidity two-point control or maximum monitoring in the duct.

With robust Polyga-Mela® humidity sensor element. With one or two switch-over contacts (HG80 or HG80-2) and internal rotary knob (HG80i). Scale range 30-100% RH.

Technical specifications

Switch contact:
200-250 VAC, max. 15A

Operating conditions:
0°-60 °C, 40-90% RH

Protection class: IP54

Installation: in the air duct

Dimensions: 80 x 120 x 300 mm

Article number: E-0611100

CAREL
Air flow monitor

Suitable for non-aggressive air or gas flows within the distribution ducts in air conditioning and ventilation systems.

The air flow monitor signals missing or reduced flow in the duct by activating a switch.

- Galvanised plate floor
- Sealed ABS housing
- IP65 (on the outside of the duct), in accordance with standard EN 60529, protection class I - EN 60335-1

Article number: DCFL 00 0100

CAREL
Differential pressure switch

For controlling the air differential pressure for filters, fans, air ducts, air conditioning and ventilation systems. The differential pressure control is particularly suitable for safety monitoring in air conditioning systems to signal the fan stop and filter clogging.

It is used in rooms with non-aggressive and non-flammable air and gas. It comes with mounting kit.

Technical specifications

Switch contact: 250 VAC, 1,5A

Protection class: IP54

Dimensions: 65 x 91 x 57 mm

Article number: DCPD 01 0100
50-500 Pa, with mounting kit

Article number: DCPD 01 1100
20-200 Pa, with mounting kit

CAREL
Leakage detector

Detects the presence of water in the room.

The leakage detector is generally used for protection against water leaks in data centres, offices, laboratories and specific rooms.
It consists of a detector (in the control cabinet) and a sensor band (at the monitoring point).

If the sensor comes into contact with water, the alarm status is immediately triggered on the detector by switching the relay.

Article number: FLOE 00 0010

Article number: FLOS 00 0000
(sensor for punctual measurement, in connection with FLOE 00 0010)

Article number: FLOR 00 0000
(sensor band for area measurement, in connection with FLOE 00 0010)

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- Operating manuals, planning data and information
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03/2020